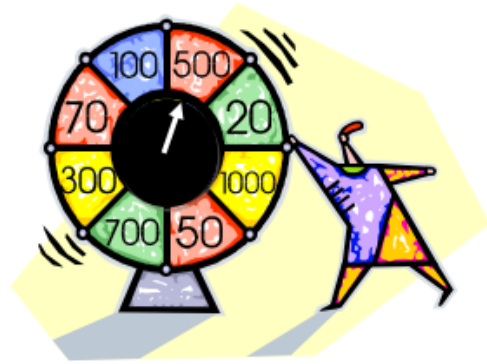


THEORETICAL PROBABILITY

Express each probability as a fraction in lowest terms.

1. What is the probability that the spinner stops on red?
2. What is the probability that the spinner stops on a color other than blue?



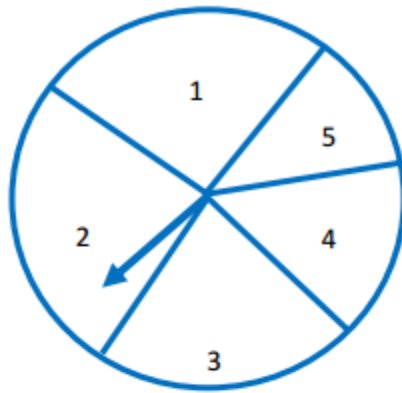
3. What is the probability that the spinner stops on a number greater than 10?
4. You spin the spinner 20 times. It stops on green twice. What is the experimental probability of stopping on green?
5. You spin the spinner 100 times. It stops on red 40 times. What is the experimental probability of stopping on red?

You are making greeting cards and selling them to friends. You use blue paper and pink paper. You also use crayons or markers. Your friends pick a greeting card at random from your bag.

	Crayon	Marker
Blue paper	7	6
Pink paper	5	2

1. What is the probability that your friend chooses a pink card?
2. What is the probability that your friend chooses a card made with crayons?
3. What is the probability that your friend chooses a pink card with marker?

Notice that the spinner below is divided into five parts with different areas.



The table shows what part of the spinner each section takes up.

Outcome	1	2	3	4	5
Probability	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{6}$	$\frac{2}{15}$

1. Use mathematics to justify that the sum of the probabilities is 1.
2. Determine the following probabilities using the values in the table. Show your work!
 - a. What is the probability of landing on an even number?
 - b. What is the probability of landing on an odd number?
 - c. What is the probability of landing on an even or an odd number?
3. Determine the following probabilities using the values in the table. Show your work!
 - a. What is the probability of landing on 2 or 3?
 - b. What is the probability of landing on 6?

Suppose you are playing a game where two dice are tossed and the values on the faces of the cubes are added together. The possible outcomes in this game will be the sums of the two dice.

Complete the table below to show all of the possible sums.

Faces	1	2	3	4	5	6
1	2	3	4			
2	3	4	5			
3						
4						
5						
6						

6. There are 36 possible outcomes. Complete the following table by calculating the probability of each possible sum.

Sum	2	3	4	5	6	7	8	9	10	11	12
Probability			$\frac{3}{36}$								

7. Determine the probability of each event using the above table. Show your work!

- What is the probability of getting a sum greater than 9?
- What is the probability of getting a sum less than or equal to 5?
- What is the probability of getting a sum that is an even number?
- What is the probability of getting a sum equal to 5, 6, or 7?
- What is the probability of getting a sum of 1?

#	Problem	Answer 1	Answer 2	Answer 3
1	You flip a coin and roll a dice. What is the probability the coin lands on heads and the dice lands on a number less than 5?	$\frac{1}{3}$ Orange	$\frac{7}{6}$ Yellow	$\frac{5}{8}$ Red
2	You have 20 shirts in your closet. 4 blue, 7 red, 3 green and 6 black. You pick one without looking. What is the probability that you pick a blue or black shirt?	$\frac{1}{4}$ Green	$\frac{1}{2}$ Blue	$\frac{3}{50}$ Purple
3	18 of the last 30 cars that passed you were black. What is the probability the next car will be black?	.18 Pink	.6 Black	.30 Green
4	Five out of 8 bags of M&Ms had exactly 32 pieces in them. How many bags out of 40 should have exactly 32 pieces?	25 Gray	20 Brown	32 Black
5	There are 18 girls and 12 boys in your class. What is the probability that a new kid entering your class will be a boy?	.12 Orange	.6 Blue	.4 Tan
6	Barb ate six cheeseburgers in the last four months. How many do you predict she will eat in two years?	16 Red	36 Yellow	3 Orange
7	$\frac{4}{5}$ of the people at the circus are kids. If 575 tickets were sold, how many are expected to be kids?	460 Pink	115 Blue	1,035 Yellow
8	A four sectioned spinner is numbered 1-4. What is the probability you spin a 2 or a 4?	1 Red	.5 Purple	.25 Dark Green
9	You roll two dice. What is the probability you get a 2 and a number greater than 2?	$\frac{1}{3}$ Brown	$\frac{1}{9}$ Purple	$\frac{1}{36}$ Black

Find the number of possible outcomes in the sample space.

- _____ You toss 4 coins.
- _____ You roll a die and toss 2 coins.
- _____ You have 5 shirts, 4 pairs of pants, and 6 pairs of shoes. How many outfits do you have?

A bag contains 12 purple marbles and 8 blue marbles. You choose a ball at random.

4. What is the probability that you select a purple marble? Express the probability as a decimal.



5. William reaches in the bag and randomly selects two marbles one after the other. What is the probability that William chooses a blue marble if the first marble was purple and not replaced?

6. With replacement, what is the probability of drawing a purple marble and then another purple marble? Express the probability as a fraction in simplest form.

A bucket contains 10 balls labeled as follows: A, A, B, C, C, C, C, D, E, E.

7. What is the probability of drawing a ball labeled C? Express the probability as a decimal.



8. What is the probability of drawing a ball labeled with something other than a B? Express the probability as a percent.

9. Sam reaches into the bucket and pulls out two balls. She pulls out an "A" and does not put it back. What is the probability that the next ball she pulls out will be another "A". Express the probability as a fraction in simplest form.

10. What is the probability of drawing an E, NOT replacing it and then a C? Express the probability as a percent.

11. What is the probability of drawing an A or B? Express the probability as a decimal.

13. Ms. Sears asked the 25 students in her class which club they participate in after school. The results are shown in the table below.

Given the results from the survey, what is the probability that a student from another class participates in the chess club?

Type of Club	Number of Students
Chess	6
Reading	5
Movie	10
Travel	4

14. What is the total number of outcomes for picking a given card from a group of 6 cards labeled S, I, L, V, E, and R, tossing a coin and rolling a number cube?

15. Paul has a bag that contains 6 green pencils, 9 red pencils, and 5 blue pencils. If he chooses 1 pencil, does not replace it, and then chooses another, what is the probability that we will get 2 green pencils? Express the probability as a decimal rounded to the nearest thousandth.

16 – 17. The manager at Chipotle tracked a random sample of customers so that he could order correctly for the upcoming week. The table shows the results of a random sample of 60 customers' orders. The manager knows that on average, Chipotle serves 2,500 meals per week.

Style of meal	Chicken	Beef	Pork	Veggie
Burrito	11	9	6	5
Bowl	3	5	1	7
Salad	4	1	0	1
tacos	2	3	2	0

16. Based on the results of the sample, how many chicken burritos should the manager have ordered for next week?

17. Based on the results of the survey, how many tacos should be ordered for next week?



18. Your bank requires you to have a 5 digit pin number for your account. You can use numbers 0-9 (that's 10 numbers!!). You are not allowed to repeat numbers. How many possible combinations of pin numbers are available?

19. There are 12 songs on a playlist. As you know, in a playlist once a song is played it will not repeat. How many different possible outcomes of playlist orders are there for the first two songs?